

MSK

Radiological Interpretation

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Objectives

- How to order XR
- How to read XR:
 - Soft tissue
 - Bone
 - Articular surface
 - Dislocation/Subluxation
 - Growth plate
 - Special situation
- CT
- MRI
- U/S
- Examples

How To Order XR

Rule of Two_s

- 2 views (AP & Lat)
 - 2 joints (above & below the #)
-
- 2 limbs (Rt & Lt)
 - 2 observers

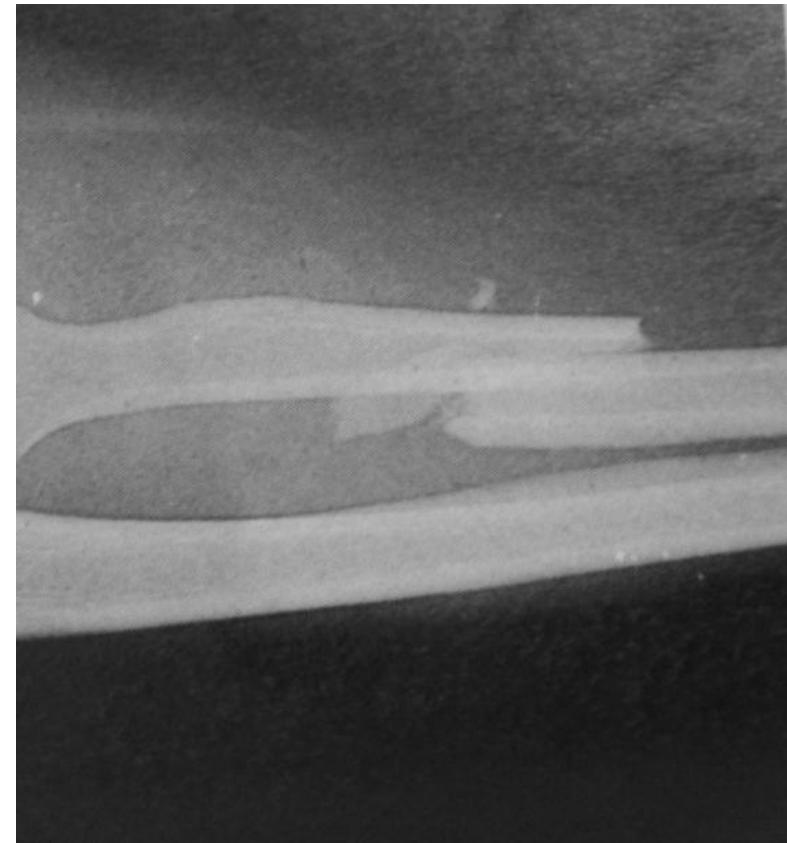
How To Order XR

- Includes:
 - A joint above & a joint below



How To Order XR

- Includes:
 - A joint above & a joint below



How To Order XR

- Includes:
 - AP & lateral



How To Read Images

How To Read Images

- Patient:
 - Name
 - File number
 - Date
- Read out-in or in-out
- Top to bottom, or reverse
- Mention:
 - Skeletal maturity
 - Centralized or not

How To Read Images

- Soft tissue:
 - Any abnormal shadow
 - Disruption of normal contour
 - Adjacent soft tissue structures as:
 - Periosteum
 - Disc spaces
 - Muscles
 - Mass effect
 - Organ / structure shift

How To Read Images

- Bone:
 - Which → bone, segment, part
 - Fracture:
 1. Type
 2. Pattern
 3. Displacement direction & %
 4. Angulation apex where
 5. Rotation
 6. Impaction
 7. Shorting / overriding
 8. Special encounters:
 1. Soft tissue interposition
 2. Open book (pelvis)
 3. Vertebral shape
 4. Pathological fracture
- Joint: congruity, subluxation, or dislocation
- Growth plates

How To Read Images

Skeletally mature



Skeletally immature



How To Read Images

Patient centralized



Soft tissue

How To Read Images- Soft Tissue

Normal contour of soft tissue & bone



How To Read Images- Soft Tissue

Any abnormal shadow- surgical emphysema



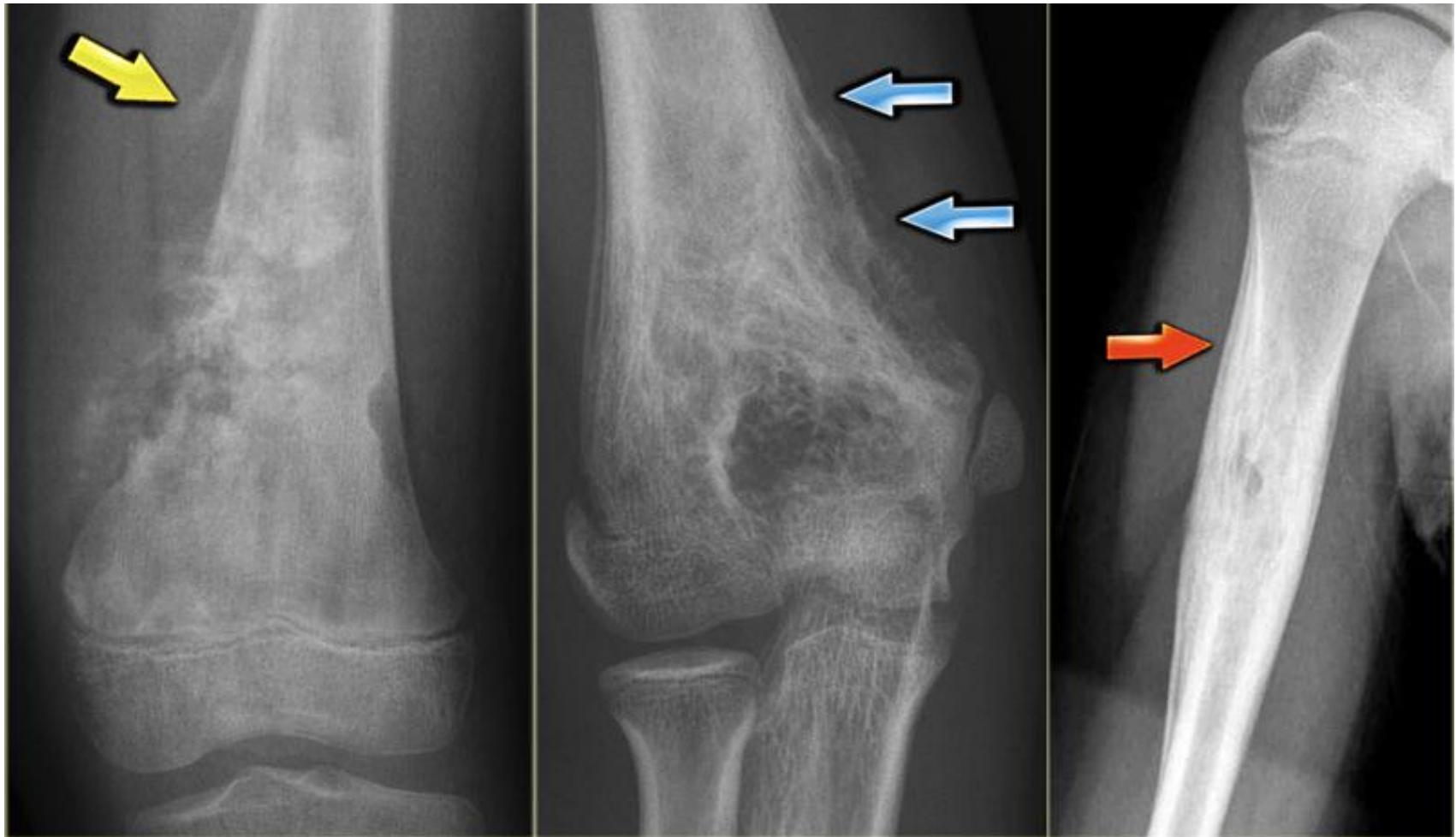
How To Read Images- Soft Tissue

Normal contour disruption



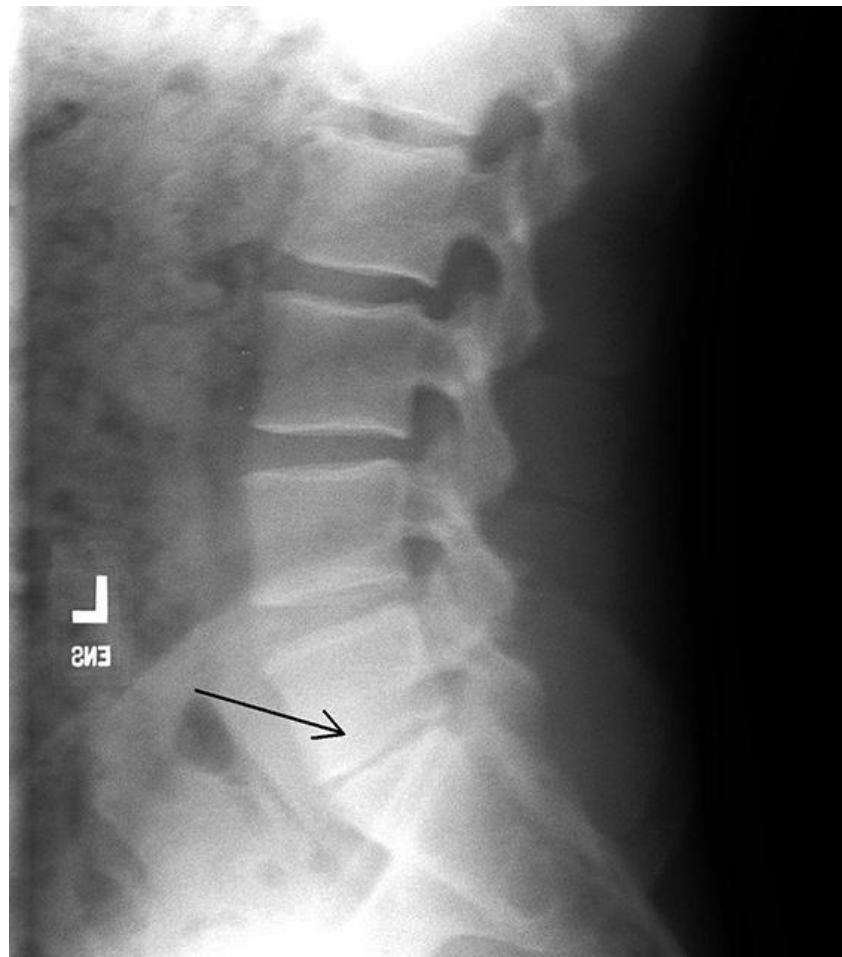
How To Read Images- Soft Tissue

Adjacent → periosteum elevation (as in infection)



How To Read Images- Soft Tissue

Adjacent → disc spaces



How To Read Images- Soft Tissue

Adjacent → muscles, (as hear “heterotopic calcification”)



How To Read Images- Soft Tissue

Mass effect from tissue on the bone



How To Read Images- Soft Tissue

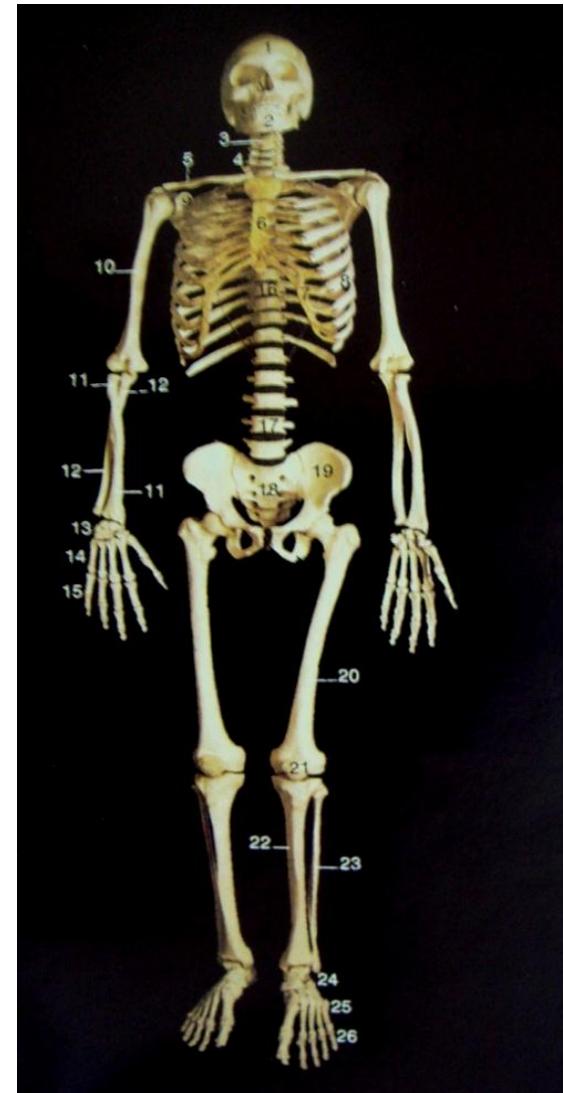
Organ / structure shift



Bone

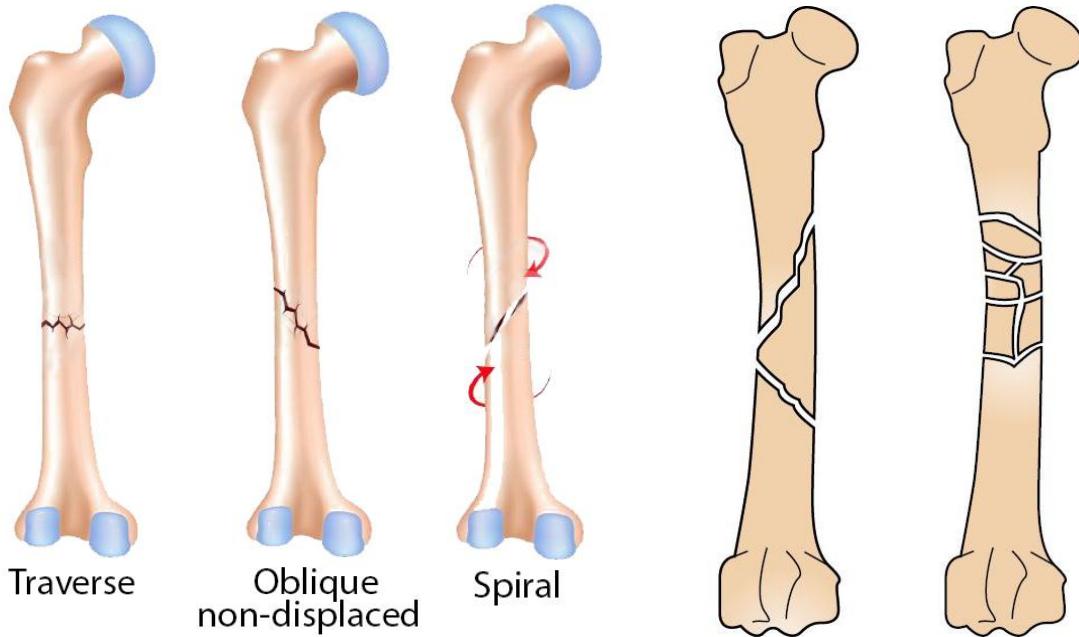
How To Read Images- Bone

- Locate:
 - Which bone
 - Segment of bone:
 - Epiphysis
 - Metaphysis
 - Diaphysis
 - Part of segment:
 - Anterior
 - Posterior
 - Medial
 - Lateral



How To Read Images- # Type

- Simple:
 - Transverse
 - Oblique
 - Short oblique
 - Spiral



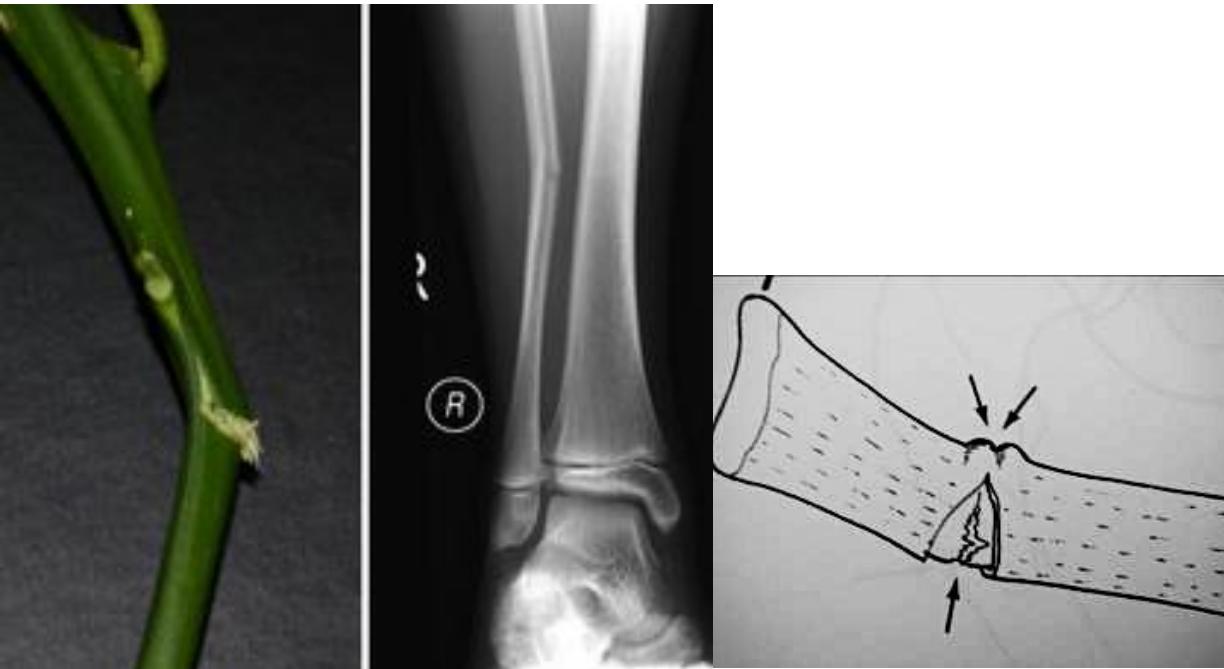
- Multi-fragments:
 - Butterfly
 - Comminuted
 - Segmental



How To Read Images- # Pattern

1. Incomplete
2. Complete
3. Greenstick (buckling)
4. Plastic deformation

Incomplete Complete

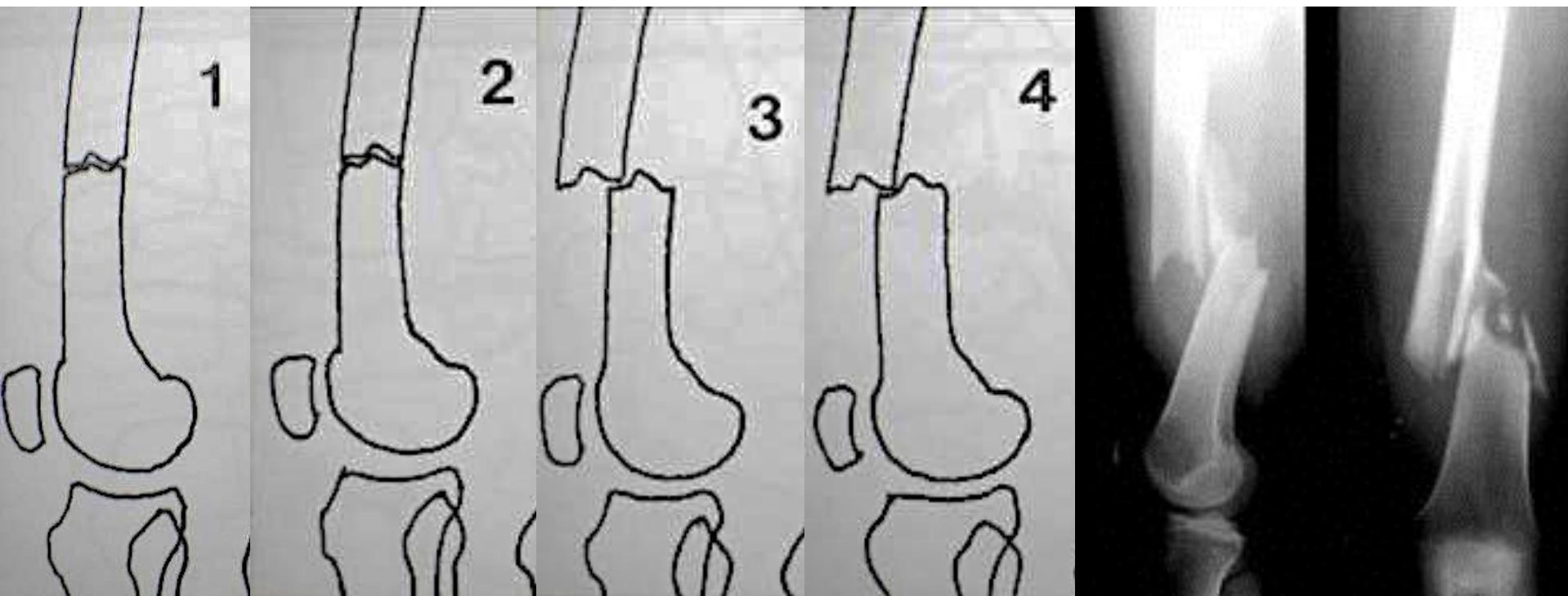


(b)



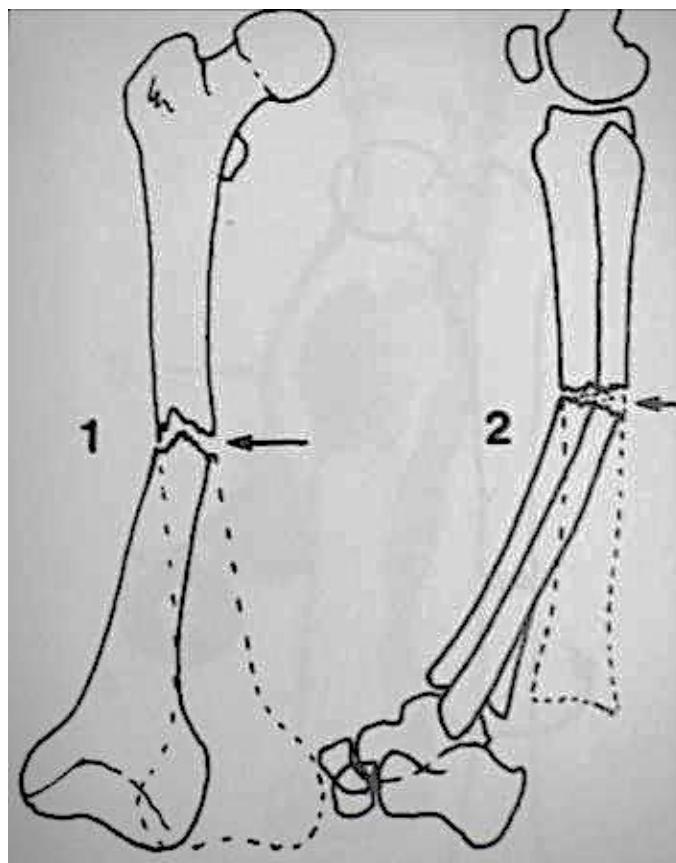
How To Read Images- # Displacement

- Or translation
- In both AP & Lat
- As → 25%, 50%, 75%, or 100%



How To Read Images- # Angulation

- Of distal fragment
- And direction of the apex



How To Read Images- # Rotation

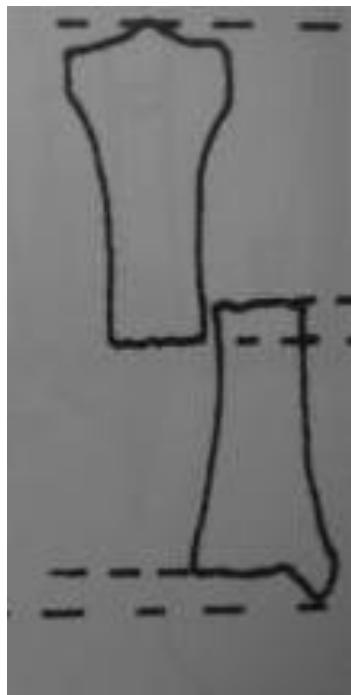
segments are not in the same orientation



How To Read Images- # Impaction



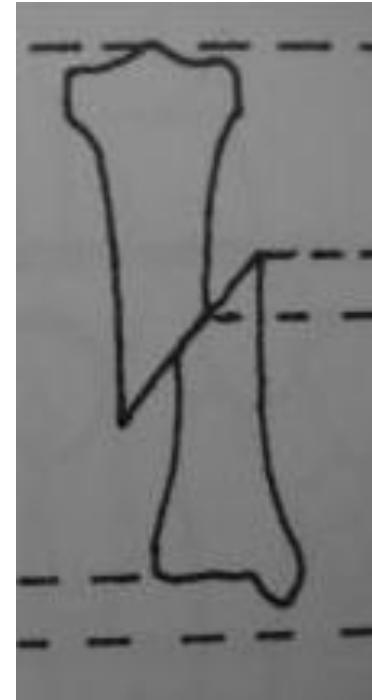
How To Read Images- # Shorting



5y old patient



3y old patient



Articular Surface

How To Read Images- Congruity

- Step (2mm)
- Impaction



Dislocation/Subluxation

How To Read Images- Dislocation



How To Read Images- Dislocation

Dislocation (alone)



Fracture dislocation



How To Read Images- Subluxation



Growth Plate

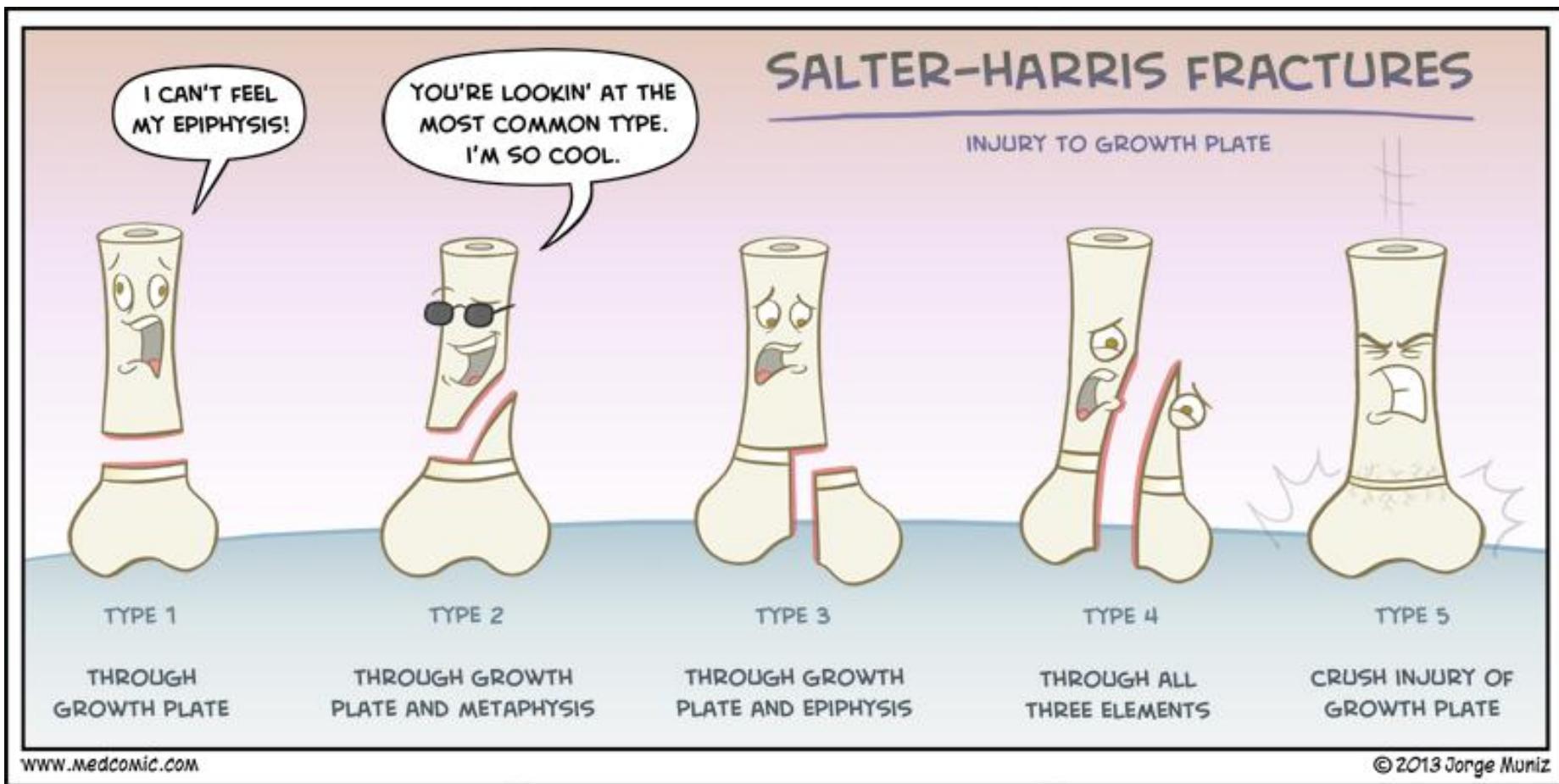
How To Read Images- Growth Plate

- Best is to compare with the opposite side
- It differs from a # by:
 - Blunt edges
 - Around joints
 - In a child ;-)



How To Read Images- Growth Plate

Salter-Harris Classification



Special Encounters

How To Read Images- Special Encounters

- Soft tissue interposition:
 - Periosteum
 - Muscle
 - Nerve
 - B.V



How To Read Images- Special Encounters

- Spine...



How To Read Images- Special Encounters

- Pathological #
 - Tumors lesion
 - Tumor-like lesions
 - Metabolic bone diseased



How To Read Images- Special Encounters

Pelvic open book #



C.T SCAN

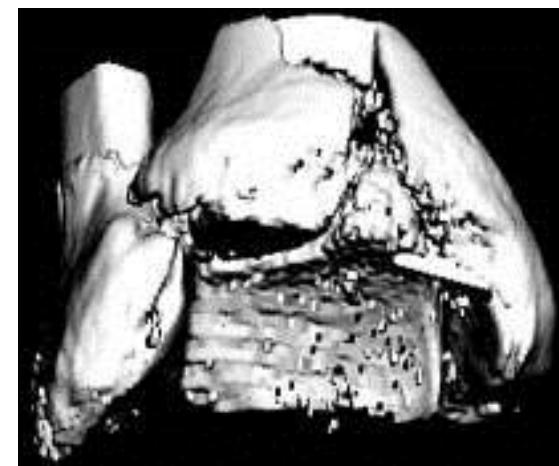
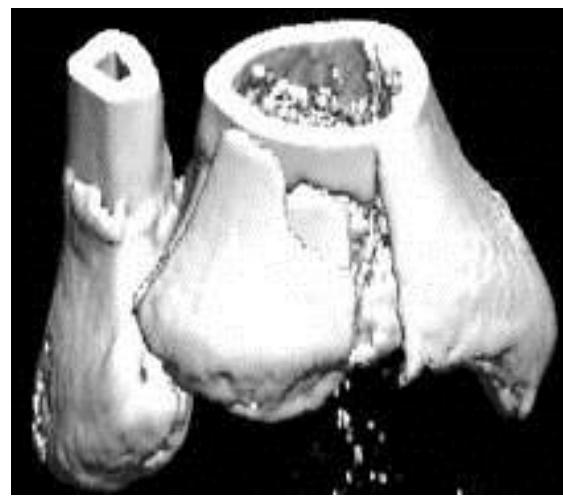
C.T

- For bony evaluation, with benefit of the 3D:
- In ALL pt's with:
 - Intra-articular #
 - Multi trauma patients, especially if unconscious
 - Pelvic #
 - Spine #
 - Pre operative in complex cases

C.T



C.T



CT



M.R.I

M.R.I

- For soft tissue evaluation:
 - Infection → early O.M
 - Ligamentous injury
 - Meniscus injury
 - Tendon cuts
 - Spinal cord injury
 - Tumor

M.R.I



-5.0mm
+4.0mm
-3.0mm
COR
90°
5.0mm

R
NS2
0.50T
FI< 25°>
TR: 1000
TI: 8
TE: 30
NU11: 7/14
ECHO: 1/1
FOV: 15cm
NEX: 2
NRT: 168H/168W
RPM: 2.5cm/sec

U/S

U/S

- Its operator dependent:
- Used mainly in:
 - Septic arthritis → amount of collection
 - O.M → periosteal elevation
 - Chronic tendon rupture
 - Muscle hematoma
 - DDH screening
- Drawback → can't differentiate between types of fluid (transudate, pus, or blood)

Examples

Example-1, Describe what you see ?



Example-2, Describe what you see ?



Any Question ?

Remember

Remember

- Patient I.D – Date
- Read out-in or in-out
- Soft tissue
- Bone:
 - Which bone, segment, part
 - Fracture: pattern, type, displacement direction & %, angulation, rotation, compression.
 - Joint: congruity, dislocation or subluxation
 - Growth plates
 - Pathological fracture